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EXAMINER

WERNER, BRIAN P

ART UNIT	PAPER NUMBER
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2621

DATE MAILED: 12/28/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/980,888

Applicant(s)

SATO ET AL.

Examiner

Brian P. Werner

Art Unit

2621

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 31 October 2005.
2a) ☒ This action is FINAL. 2b) ☐ This action is non-final.
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-19 is/are pending in the application.
4a) Of the above claim(s) _____ is/are withdrawn from consideration.
5) ☐ Claim(s) _____ is/are allowed.
6) ☒ Claim(s) 1-19 is/are rejected.
7) ☐ Claim(s) _____ is/are objected to.
8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Amendment

1. The arguments and remarks received on October 31, 2005 has been entered. Claims 1-19 remain pending.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1-4, 9-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Uomori (US 5,726,704 A) and Sundahl et al. (US 6,094,215 A).

The Uomori Reference

Regarding independent claim 1, Uomori discloses:

A method comprising (Note: the embodiment relied upon by the examiner is embodiment 4, beginning at column 13, line 23 and concluding at column 15, line 33; figures 16-18 relate to this embodiment):

Art Unit: 2621

determining a position of an object in a first image (figure 18, " A_L "; "points A_L and A_R indicate the same point in the same object in the left and right images, respectively" at column 14, line 23);

determining a position of an object in a second image (figure 18, " A_R "; "points A_L and A_R indicate the same point in the same object in the left and right images, respectively" at column 14, line 23); and

moving one of the first image or the second image so that the object in the first image coincides with the object in the second image (figure 18, " Δx_{ave} "; "the right image is shifted ..." at column 14, line 27; "the entire images are moved horizontally" at column 14 line 33).

Regarding independent claim 9, Uomori discloses an apparatus corresponding to method limitations addressed with respect to claim 1 above (i.e., refer to Uomori figure 16). Regarding the means-plus-function language, which is interpreted by the examiner with respect to 35 USC 112, sixth paragraph, the structure of Uomori figure 6 is equivalent to the structure disclosed by the applicant at figure 9.

Regarding claim 11, Uomori discloses a shift amount setting means (in the fourth embodiment, this limitation is met by at least numeral 30 of figure 16, which determines the shift amount as described at column 13, lines 61-65 and column 14, lines 41-60; FYI this limitation is also met by the " α " value at column 14, line 64; this limitation is also met by the fifth embodiment of Uomori, e.g. at figure 19, numeral 36).

Regarding claim 12, Uomori discloses a shift mode setting means ("can be set to a prescribed binocular parallax value α " at column 14, line 66).

Differences

Regarding independent claims 1 and 9, while Uomori discloses a stereo image pickup apparatus (e.g., figure 4A, numeral 37), Uomori does not teach that:

the first image is picked up with a pickup apparatus in a predetermined first state and the second image is picked up with the pickup apparatus in a second state different from the first state (Note 1: regarding claim 1, this limitation recites specific structure in a method claim; the structure is given weight because it is necessary for performing the method; Note 2: regarding claims 1 and 9, the structure limitation is construed as a single image pickup apparatus that changes its physical state in order to pick up a second image, such as but not limited to the various embodiment of the applicant's disclosure).

The Sundahl Reference

Regarding claims 1 and 9, Sundahl discloses a system in the same field of stereoscopic image processing and addresses the same area of 3D image capture, wherein Sundahl teaches a single image pickup apparatus (figure 1, numeral 104; "single camera" at column 2, line 12) picking up both images (as depicted in figure 1), with the image pickup apparatus is in a different state when picking up the second image ("second location" at column 1, line 58).

Regarding claims 2 and 13, Sundahl teaches parallel movement of the single image pickup apparatus ("lateral translation illustrated by arrow 120" at column 2, line 45).

Art Unit: 2621

Regarding claims 3 and 14, Sundahl teaches rotational movement of the single image pickup apparatus (“may include a rotation motion illustrated by arrow 124” at column 2, line 46).

Regarding claim 10, Sundahl teaches a frame image generating means (figure 1, numeral 136) generating a frame image based on the moved at least one of the first and second images (“The digital image is stored in memory device 136” at column 3, line 41; this is equivalent to applicant’s disclosed structure which is also a memory at applicant’s figure 9, numerals 61 and 62).

Regarding claims 4 and 15, Sundahl teaches the pickup apparatus as having a condenser type optical means (the digital camera depicted in figure 1 has a lens; a condenser lens is a converging lens, which is the type of lens used by cameras) disposed between an image pickup element (“CCD” at column 3, line 33) and a target object (figure 1, numeral 108), movable to any position holding an optical axis parallel to the pickup element (the optical axis of digital cameras have a fixed relationship with the CCD; even when the camera is moved from the first to the second position, and even if the lens is focused, the optical axis remains fixed).

The Combination

It would have been obvious at the time the invention was made to one of ordinary skill in the art to utilize a single image pickup apparatus as taught by Sundahl, in place of the two cameras of Uomori (e.g., Uomori figure 24A, numeral 37), in order to capture both images by repositioning the single camera as taught by Sundahl. One of ordinary skill would be motivated to make this substitution in order to simplify and thus reduce to cost of the two-camera image

Art Unit: 2621

pickup apparatus of Uomori (i.e., “the problem with using two cameras is that it is more expensive than a single camera arrangement” at Sundahl column 1, line 35).

4. Claims 1, 5, 6, 9, 16 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Uomori (US 5,726,704 A) and Pritchard et al. (US 5,157,484 A).

The Uomori Reference:

Regarding claims 1 and 9, Uomori discloses a method and apparatus as described above.

Differences:

Uomori does not teach a single image pickup apparatus (i.e., a single camera) picking up both images as described above.

The Pritchard Reference:

Regarding claims 1 and 9, Pritchard discloses a system in the same field of stereoscopic image processing, where he addresses the same area of 3D image capture, wherein Pritchard teaches a single image pickup apparatus (figure 11; “single camera” at column 10, line 25) picking up both images (as depicted in figure 10, by axes 136 and 135), with the image pickup apparatus is in a different state when picking up the second image (in a first state to pick up the first image, the “shifter 131 is not rotated” and in the second state, the “shifter 131 is rotated” at column 12, lines 1-3).

Art Unit: 2621

Regarding claims 5 and 16, the angle controlling means disposed between a pickup element and a target object (as depicted in figure 10) controlling an outgoing angle of light emitted to a pickup face of the pickup apparatus (as depicted by the axes 136 and 135 in figure 10) where the first and second states are controlled by first and second angles of the angle controlling means (in a first state to pick up the first image, the “shifter 131 is not rotated” and in the second state, the “shifter 131 is rotated” at column 12, lines 1-3).

Regarding claims 6 and 17, angle controlling means as comprising a variable apex-angle prism (figure 10, numeral 131 is a prism in that it bends light, where its apex angle is variable by rotation as described above and depicted in the figure).

The Combination:

It would have been obvious at the time the invention was made to one of ordinary skill in the art to utilize a single image pickup apparatus as taught by Pritchard, in place of the two cameras of Uomori, in order to capture both images by repositioning the incoming light angle as taught by Pritchard (i.e., at figure 10). One of ordinary skill would be motivated to make this substitution in order to simplify the image pickup apparatus by obviating the problems associated with a two camera system, such as “constant alignment adjustment” (Pritchard, column 3, line 33), the requirement for a “good deal of operator skill” (Pritchard, column 3, line 27), and the need for a “special mount to hold two cameras ... [which] makes it large and heavy” (Pritchard, column 3, line 38).

Art Unit: 2621

5. Claims 1, 7, 8, 9, 18 and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Uomori (US 5,726,704 A) and Lia (US 5,222,477 A).

The Uomori Reference:

Regarding claims 1 and 9, Uomori discloses a method and apparatus as described above.

Differences:

Uomori does not teach a single image pickup apparatus (i.e., a single camera) picking up both images as described above.

The Lia Reference:

Regarding claims 1 and 9, Lia discloses a system in the same field of stereoscopic image processing, where he addresses the same area of 3D image capture, wherein Lia teaches a single image pickup apparatus (figure 6, numeral 22) picking up both images (as depicted by the optical path division depicted in figures 2 and 4; e.g., in figure 2, the right image is picked up and in figure 4, the left image is picked up), with the image pickup apparatus is in a different state when picking up the second image (the left and right shutters of numeral 30 are open and closed in the different states as depicted in figures 2 and 4).

Regarding claims 7 and 18, Lia teaches a light transmitting means with a light entering face and a light exiting face formed parallel to each other (figure 2, numeral 26) and arranged on a path between a pickup element and a target object (numeral 26 is “disposed at the distal end of the camera 21” at column 3, line 58) to be insertable at a predetermined angle (numeral 26 is at a

Art Unit: 2621

fixed angle, and is insertable into the optical path when the shutters 30 are opened and closed), where a first state the light transmitting means fails to be inserted on the path (e.g., in figure 2, the left shutter is closed) and in a second state, the light transmitting means is inserted in the path (e.g., figure 4, the left shutter is opened, thus inserting the plate 26 into the optical path).

Regarding claims 8 and 19, Lia teaches the light transmitting means as comprising a transparent parallel plate (plate 26 in figure 2 is a window, having parallel entry and exit surfaces as depicted; it is also transparent; i.e., “A transparent face plate 26” at column 3, line 57).

The Combination:

It would have been obvious at the time the invention was made to one of ordinary skill in the art to utilize a single image pickup apparatus as taught by Lia, in place of the two cameras of Uomori, in order to capture both images by selectively inserting the window into the optical path as taught by Lia (i.e., at figures 2 and 4), in order to simplify the image pickup apparatus by obviating the problems associated with a two camera system, such as the “manufacturing” problems (Lia, column 1, line 37; the “cost” (Lia, column 3, line 40), the matching and alignment (Lia, column 3, line 43) and bulk and weight associated with two cameras (Lia, column 1, lines 48-49).

Response to Arguments

6. Applicant's arguments filed on October 31, 2005 have been fully considered but they are not persuasive:

Summary of Applicant's Remark:

“Claim 1 is directed to a stereoscopic-image generating method comprising determining a position of an object in a first image, determining a position of the object in a second image, wherein the first image is picked up with a pickup apparatus in a predetermined first state and the second image is picked up with the pickup apparatus in a second state different from the first state, and moving one of the first image or the second image so that the object in the first image coincides with the object in the second image.”

Applicant's Remarks, page 8

Examiner's Response: Agreed. This statement is a recapitulation of claim 1.

Summary of Applicant's Remark:

“Uomori discloses a stereoscopic image pickup and display apparatus. Fig. 1 shows the

Art Unit: 2621

stereoscopic image apparatus calculates an average value for the parallax over an entire screen or a weighted average value with greater weight at the center of the screen.”

Applicant's Remarks, page 8

Examiner's Response: Agreed in part. Applicant's description of figure 1 characterizes the Uomori reference as it pertains to figure 1. However, it is noted that the examiner is relying upon Uomori's "fourth embodiment" as described at column 13, line 26, and depicted in figures 16-18. In the previous office action, at paragraph 4 (page 3), the examiner stated the following:

"A method comprising (Note: the embodiment relied upon by the examiner is embodiment 4, beginning at column 13, line 23 and concluding at column 15, line 33; figures 16-18 relate to this embodiment):"

Otherwise, the examiner is in agreement with applicant's characterization of the Uomori reference.

Summary of Applicant's Remark:

"As the Examiner has stated, Uomori neither discloses nor suggests moving one of the first image or the second image so that the object in the first image coincides with the object in the second image, as required by claim 1. Thus, it would not be obvious at the time the invention

Art Unit: 2621

was made to one of ordinary skill in the art to utilize a single image pickup apparatus as taught by Sundahl, in place of the two cameras taught throughout Uomori to derive claim 1, or claims 2-4 that depend from claim 1.”

Applicant's Remarks, page 9

Examiner's Response: Regarding the statement that “as the Examiner has stated, Uomori neither discloses nor suggests moving one of the first image or the second image so that the object in the first image coincides with the object in the second image, as required by claim 1”, this is an incorrect characterization of the examiner's statement of differences advanced in the previous office action.

The examiner agrees that that claim 1 requires “moving one of the first image or the second image so that the object in the first image coincides with the object in the second image”. However, Uomori teaches this requirement as described at page 3, paragraph 4 of the previous office action as follows:

“determining a position of an object in a first image (figure 18, “A_L”; “points AL and AR indicate the same point in the same object in the left and right images, respectively” at column 14, line 23);

determining a position of an object in a second image (figure 18, “A_R”; “points AL and AR indicate the same point in the same object in the left and right images, respectively” at column 14, line 23); and

Art Unit: 2621

moving one of the first image or the second image so that the object in the first image coincides with the object in the second image (figure 18, " Δx_{ave} "; "the right image is shifted ..." at column 14, line 27; "the entire images are moved horizontally" at column 14 line 33)."

Page 3, paragraph 4 of previous office action

The examiner did NOT identify this claimed requirement as a deficiency of Uomori. Rather, the examiner identified the following element as a deficiency:

"

Differences

Regarding independent claims 1 and 9, while Uomori discloses a stereo image pickup apparatus (e.g., figure 4A, numeral 37), Uomori does not teach that:

the first image is picked up with a pickup apparatus in a predetermined first state and the second image is picked up with the pickup apparatus in a second state different from the first state (Note 1: regarding claim 1, this limitation recites specific structure in a method claim; the structure is given weight because is it necessary for performing the method; Note 2: regarding claims 1 and 9, the structure limitation is construed as a single image pickup apparatus that changes its physical state in order to pick up a second image, such as but not limited to the various embodiment of the applicant's disclosure)."

Page 4, paragraph 4 of previous office action

That is, the examiner identified the element of the first image being picked up with a pickup apparatus in a predetermined first state and the second image is picked up with the pickup apparatus in a second state different from the first state as the difference. This is a fundamentally different claimed element than “moving one of the first image or the second image so that the object in the first image coincides with the object in the second image, as required by claim 1”, as alleged by the applicant as being the difference.

Assuming that the applicant intended to characterize the difference between Uomori and the claimed invention as first image being picked up with a pickup apparatus in a predetermined first state and the second image is picked up with the pickup apparatus in a second state different from the first state, the examiner still disagrees. Given applicant’s argument that because Uomori teaches a stereo camera in figure 1, and “thus, it would not be obvious at the time the invention was made to one of ordinary skill in the art to utilize a single image pickup apparatus as taught by Sundahl, in place of the two cameras taught throughout Uomori to derive claim 1, or claims 2-4 that depend from claim 1”, the examiner disagrees for the following reasons:

First, Uomori does not limit himself to the camera arrangement of figure 1. In fact, in the embodiment of fourth embodiment relied upon by the examiner as described above (i.e., Uomori column 13, line 23 and concluding at column 15, line 33, as depicted in figures 16-18), Uomori does not even require a specific image pickup apparatus. Rather, the fourth embodiment begins

Art Unit: 2621

not with a specific image pickup apparatus, but rather with a stereoscopic image pair having already been picked up (or created) by any source (i.e., figure 16, “left-image signal” and “right-image signal”). The fourth embodiment is intended to be utilized with any stereoscopic image pair for purposes of parallax correction for proper viewer perception of the image. The image pickup apparatus used is irrelevant. However, even if Uomori utilizes the image pickup apparatus of figure 1 for capturing the left and right images for processing by the apparatus of figure 16, Uomori’s preferred embodiment is not limited to, and does not directly depend on the specific structure of the pickup apparatus. Other methods of capturing a stereoscopic image, if beneficial, would have been obvious to those of ordinary skill in the art. For example, per the above prior art combinations,

Sundahl teaches a single image pickup apparatus (figure 1, numeral 104; “single camera” at column 2, line 12) picking up both images (as depicted in figure 1), with the image pickup apparatus in a different state when picking up the second image (“second location” at column 1, line 58), and

it would have been obvious at the time the invention was made to one of ordinary skill in the art to utilize a single image pickup apparatus as taught by Sundahl, in place of the two cameras of Uomori (e.g., Uomori figure 24A, numeral 37), in order to capture both images by repositioning the single camera as taught by Sundahl. One of ordinary skill would be motivated to make this substitution in order to simplify and thus reduce the cost of the two-camera image pickup apparatus of Uomori (i.e., “the problem with using two cameras is that it is more expensive than a single camera arrangement” at Sundahl column 1, line 35).

Pritchard teaches a single image pickup apparatus (figure 11; “single camera” at column 10, line 25) picking up both images (as depicted in figure 10, by axes 136 and 135), with the image pickup apparatus is in a different state when picking up the second image (in a first state to pick up the first image, the “shifter 131 is not rotated” and in the second state, the “shifter 131 is rotated” at column 12, lines 1-3), where

it would have been obvious at the time the invention was made to one of ordinary skill in the art to utilize a single image pickup apparatus as taught by Pritchard, in place of the two cameras of Uomori, in order to capture both images by repositioning the incoming light angle as taught by Pritchard (i.e., at figure 10). One of ordinary skill would be motivated to make this substitution in order to simplify the image pickup apparatus by obviating the problems associated with a two camera system, such as “constant alignment adjustment” (Pritchard, column 3, line 33), the requirement for a “good deal of operator skill” (Pritchard, column 3, line 27), and the need for a “special mount to hold two cameras ... [which] makes it large and heavy” (Pritchard, column 3, line 38), and

Lia teaches a single image pickup apparatus (figure 6, numeral 22) picking up both images (as depicted by the optical path division depicted in figures 2 and 4; e.g., in figure 2, the right image is picked up and in figure 4, the left image is picked up), with the image pickup apparatus is in a different state when picking up the second image (the left and right shutters of numeral 30 are open and closed in the different states as depicted in figures 2 and 4), where

Art Unit: 2621

it would have been obvious at the time the invention was made to one of ordinary skill in the art to utilize a single image pickup apparatus as taught by Lia, in place of the two cameras of Uomori, in order to capture both images by selectively inserting the window into the optical path as taught by Lia (i.e., at figures 2 and 4), in order to simplify the image pickup apparatus by obviating the problems associated with a two camera system, such as the “manufacturing” problems (Lia, column 1, line 37; the “cost” (Lia, column 3, line 40), the matching and alignment (Lia, column 3, line 43) and bulk and weight associated with two cameras (Lia, column 1, lines 48-49).

The aforementioned Sundahl, Pritchard and Lia references each teach alternate means for capturing a stereoscopic image pair, having advantages of their own. The combination of Uomori with each of these references teaches all of the claimed elements, has a full expectation of success, and does not teach away of a primary operating principal of Uomori’s fourth embodiment in any manner. The examiner contends that the above prior art combinations are proper and well founded for at least these reasons.

The remainder of applicant’s arguments have been address in the examiner’s responses above.

Conclusion

7. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the mailing date of this final action.

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Brian P. Werner whose telephone number is 571-272-7401. The examiner can normally be reached on M-F, 8:00 - 4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Joseph Mancuso can be reached on 571-272-7695. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 2621

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Brian Werner
Primary Examiner
Art Unit 2621
December 20, 2005



BRIAN WERNER
PRIMARY EXAMINER